ASOS MODIFICATION NOTE 50 (for Electronics Technicians)
Engineering Division
W/OSO321:AJW/WDW
Revision Date: 09/24/99

SUBJECT	:	Automated Surface Observing System (ASOS) Voice Processor Board (VPB), 1A2A20, Firmware Version 4.0 Upgrade
PURPOSE	:	To add additional Meteorological Aviation Report vocabulary to the ASOS.
EQUIPMENT AFFECTED	:	ASOS Acquisition Control Unit (AACU)
PARTS REQUIRED	:	EPROM P/N 62828-45015-1 (U32) EPROM P/N 62828-45016-1 (U33) EPROM P/N 62828-45017-1 (U34)
MOD PROCUREMENT:		The above parts will be initial issued by Washington Central Support. One set of voice erasable programmable read only memory (EPROM) chips, S100-FMK-50, for each ASOS and, one set for the spare's kit voice board will be issued.
EFFECTIVITY	:	All ASOS sites.
SPECIAL TOOLS REQUIRED	:	Integrated circuit (IC) insertion tool (ASN: 041-T-13) IC extraction tool (ASN: 041-T-16) Electrostatic discharge (ESD) straps
TIME REQUIRED	:	1 hour
EFFECT ON OTHER INSTRUCTIONS	:	Engineering Handbook No. 11 (EHB-11), section 3.6, Modification Note 50 ***must be installed after Modification Note 47***. This modification note supersedes Modification Note 32; Remove it from EHB-11.
AUTHORIZATION	:	This modification is authorized by ECP E98SM05F215
VERIFICATION STATEMENT	:	This modification was tested for operational integrity at the Engineering Design Branch Laboratory and sites listed in appendix A.

GENERAL

This modification note provides instructions to upgrade the ASOS voice firmware by removing and replacing three EPROM microcircuits. Before performing Modification Note 50, reference EHB-11, section 3.6, ASOS Modification Note 47.

Digital Voice Processing consists of three operations: producing a verbal report based on current ASOS data from a stored vocabulary, recording an operator-generated addendum up to 90 seconds long, and producing an output consisting of the automatically generated data and the operator input. Outputs are available for the Federal Aviation Administration (FAA) handset, dial-up reports, and ground-to-air (GTA) radio communications for aircraft. Voice processing is accomplished with two dedicated boards: a VPB and a Voice Recorder/Playback board. The VPB contains the central processing unit (CPU) for the digital voice system. It receives digital voice files from the ASOS CPU, creates voice reports consistent with the data reported by the sensors, and receives operator-generated digitized audio from the Voice Recorder/Playback board. The Voice Recorder/Playback board receives digitized voice from the VPB and converts the data into audio. Audio is output for dial-in weather requests, for the FAA handset at operator interface device (OID) port 5C, and to an GTA transmitter for pilot use. In addition, the Voice Recorder/Playback board receives input voice audio from the FAA handset, digitizes the input audio, and transfers the digitized audio to the VPB for storage in random access memory.

PROCEDURE

The instructions, for this modification note, describe the removal and installation of EPROMs U32-U34, on the VPB, 1A2A20. (Refer to figure 1). If installing in conjunction with Modification Note 47, complete steps 3-12 under ASOS VPB EPROMS installation.

BEFORE INSTALLATION OF THE VOICE PROCESSOR BOARD (VPB) EPROMS

1. Call the ASOS Operations and Monitoring Center (AOMC) at 1-800-242-8194 and provide notification on which ASOS you will be installing firmware version 4.0 for the VPB. Confirm with the AOMC, the site-specific database is available and upload the current configuration before installing firmware 4.0.

2. Get approval of the responsible MIC/OIC/Observer before installation begins. Installation of firmware 4.0 may be performed on any day of the month if restrictions in steps 3 and 4 are satisfied.

3. **Commissioned Sites Only**: Do not start installation during inclement weather, precipitation, instrument flight rule conditions, or if any of those conditions are expected within 3 hours. The responsible MIC/OIC/Observer will define these meteorological conditions.

4. Do not start firmware installation at a time that will conflict with scheduled synoptic observations at 00, 03, 06, 09, 12, 15, 18, and 21Z. Although 30 minutes should be sufficient, allow one hour to complete installation and restart ASOS.

5. Immediately before beginning work at a National Weather Service (NWS) staffed sites, the MIC/OIC/Observer will inform the air traffic control tower (ATCT) and any other critical users the ASOS will be turned off for the VPB upgrade. At an un-staffed site, the electronics technician (ET) will inform the ATCT using controller video displays (CVD) and OID to log off and shut down the displays to avoid problems.

6. Do not begin the installation process until immediately after an hourly observation has been transmitted. At NWS-staffed sites, normal backup observing procedures will be implemented.

Note:
DO NOT disable the local OID in step c.

7. Make the appropriate SYSLOG entries (**MAINT-ACT-FMK**) for Modification Note 50.

   a. Log on as **TECH**.
   b. Key to the AOMC page (**REVUE-SITE-VERSN-AOMC**). Wait for the external communication and site physical lines to change from "UPLOAD REQ" to "COMPLETE." When complete, key the **EXIT** key.
   c. Key to the comms page (**REVUE-SITE-CONFG-COMMS**) to disable all hardware and communication ports. When complete, key **EXIT** key.
   d. Key to the AOMC page (**REVUE-SITE-VERSN-AOMC**) and cancel the automatic update of the RS-232 comm started by the configuration changes made in step c. When complete, key **EXIT** key.
   e. Key the **MAINT** screen.
   f. Key the **ACT** page.
   g. Key **START** - Stop here and perform “ASOS VOICE PROCESSOR BOARD EPROMS INSTALLATION.”

ASOS VPB EPROMS INSTALLATION

1. **At the ACU:** Set the OUTPUT POWER switch on the uninterruptible power supply (UPS) status panel to the **OFF** position. The indicator for the OUTPUT status panel extinguishes. (This step is only required on systems with a UPS).

CAUTION:

Damage to equipment may result if power is not removed prior to removal or installation of the EPROMs and to avoid any damage to circuit boards and IC, use proper ESD handling procedures, found in EHB-5, Techniques and Procedures.

2. Remove the facility power from the ACU cabinet.

3. Prior to removing the VPB CPU, 1A2A20, disconnect the cable from the front of the board by exerting outward force on the cable release tabs at the top and bottom of the connector.

4. Using a small flat-tipped screwdriver, loosen the captive screws at the top and bottom of the VPB CPU.

CAUTION:

Throughout this procedure, discharge any static electricity from the screwdriver before and during use by touching tool to the grounded chassis surface. Also, lift the IC as evenly as possible. Failure to comply may result in damage to the IC.

5. If the VPB is equipped with extractor handles, press handles in the opposite direction to release the board. If the board does not have extractor handles, gently rock the board while exerting outward pressure and remove the board from the rack.

6. Using the IC extraction tool, remove the U32 EPROM from the front of the board slide. Carefully lift up on U32 to remove it from the socket as evenly as possible. After U32 is removed from the socket, place in a conductive foam or on some other static-free surface. (Refer to figure 1 for IC locations).

7. Repeat step 6 for the removal of ICs U33 and U34.

8. Remove the new EPROMs, for firmware 4.0, from the protective package and insert them into the VPB sockets in accordance with the chart below. Using the IC insertion tool and ensuring the EPROMs are installed with pin 1, as identified by the notch in the top of IC, press the EPROMs into their respective sockets.

IC socket	IC Part number
U32	45015
U33	45016
U34	45017

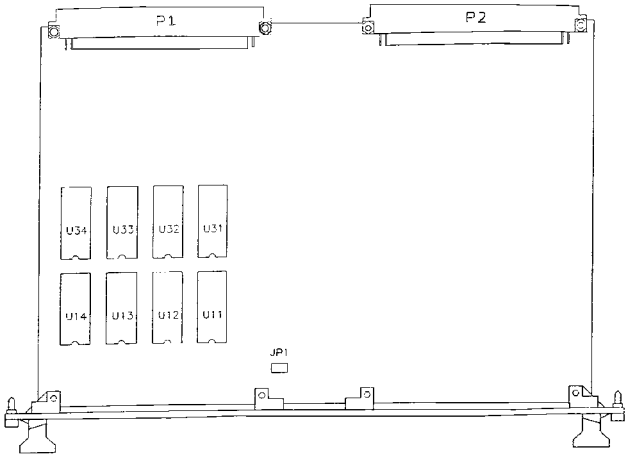
9. Holding the VPB by the handles, position the board with the component side to the right and carefully slide the board into the card rack on its guides. Align the board with the rear connector and press firmly into place.

10. Using a small flat-tipped screwdriver, tighten the captive screws at the top and bottom of the VPB.

11. After reinstalling the VPB, reconnect the cable attached to the front of the board.

12. This completes Modification Note 50. If completing this modification in conjunction with Modification Note 47, return to page 7, step 18, of Modification Note 47.

13. Continue with “AFTER INSTALLATION OF FIRMWARE 4.0 UPGRADE.”



VOICE PROCESSOR BOARD 1A2A20
ASSY 62828-47018-10
ALL COMPONENTS NOT SHOWN

IC socket	IC part number
U11	62828-45010-1
U12	62828-45011-1
U13	62828-45012-1
U14	62828-45013-1
U31	62828-45014-1
U32	62828-45015-1
U33	62828-45016-1
U34	62828-45017-1

Figure 1 Voice Processor Board (1A2A20)

AFTER INSTALLATION OF FIRMWARE VERSION 4.0 UPGRADE

1. When ASOS is restarted at un-staffed sites, call to inform the ATCT using CVDs and OIDs to turn on their displays. (At staffed sites, the MIC/OIC/Observer will call the ATCT.)

2. If on-site, NWS staff provides backup while the installation is underway, no special observation is needed when the ASOS is restarted.

3. *If there is no backup at a site and a record observation was missed during the installation*, a special observation must be taken when ASOS is restarted. The ET should take the following steps at the ASOS keyboard after installation:

   a. Sign on system as **OBSERVER**.
   b. Key **GENOB**;
   c. Key **SPEC**;
   d. Key **XMIT**;
   e. Key **SIGN**;
   f. Type your initials again and key [RETURN];
   g. Key [RETURN] twice. This signs the "observer" off the ASOS; and
   h. Leave ASOS running.

Note:
The observer must sign off before the 5-minute edit time is up.

4. Inform the office staff that ASOS is again operational. If less than 25 minutes remain until the next hourly observation, augmentation of the ceiling may be required. It might also be necessary to augment several elements or even the entire observation. The chart below indicates how long it takes after a start up for ASOS to report each observation element automatically.

Times Needed for Elements to be Reported Automatically

	Minimum	Maximum
Pressure	60 seconds	10 minutes
Precipitation Amount	60 seconds	*
Wind direction	2 minutes	7 minutes
Wind speed	2 minutes	7 minutes
Precipitation Type	2 minutes	*
Temperature	5 minutes	10 minutes
Dew Point	5 minutes	10 minutes
Visibility	10 minutes	15 minutes
Obstruction to Visibility	10 minutes	*
Ceiling	30 minutes	35 minutes

* Maximum time not applicable since phenomena may not be present. Minimum time applies if phenomena are present.

5. Verify that ASOS transmitted an hourly observation. Call the AOMC at 1-800-242-8194 and tell the operator:

   a. Your location.
   b. That installation of firmware 4.0 has been completed.
   c. That ASOS is operational.

6. Enter in the SYSLOG that maintenance has been completed.

   a. Sign on system as **TECH**.
   b. Key the **MAINT** screen.
   c. Key the **ACT** page.
   d. Key **FMK** - Enter the Field Mod Kit (FMK) number as follows: **Mod 50**. Press **(ENTER)**. On the second line of the screen verify that only Mod 50 is displayed. Complete by entering **Y** in the [Y/N] area if only Mod 50 is displayed.
   e. Check the SYSLOG and verify the FMK message. Enter a comment in the SYSLOG stating that VPB firmware version 4.0 has been installed.

7. At an expansion site with an ATCT, the ET will contact the ATCT and supply information on the following:

   a. The ASOS maintenance has been completed.
   b. The ASOS has been restored to service.
   c. The ATCT CVDs, OIDs, and TRACON displays need to be turned on.

SHIPPING INSTRUCTIONS

After Modification Note 50 has been completed, package the old EPROMs in an anti-static package and ship to the National Reconditioning Center, ASOS repair.

REPORTING MODIFICATION

Target date for completion of this modification is 30 days after the receipt of parts for commissioned sites. Report completed modification on an NWS Form A-26, Maintenance Record, using the instructions in Engineering Handbook No. 4 (EHB-4), Engineering Management Reporting System (EMRS), part 2, appendix F. Report the modification to the ACU using the equipment code **AACU** in Block 7. Record a modification number of **50** in Block_17a of the A-26. Refer to appendix B for a completed sample of NWS Form A-26, Maintenance Record.

Original Signed

John McNulty
Chief, Engineering Division

Appendix A - Test Sites
Appendix B - A 26

TEST SITES FOR FIRMWARE VERSION 4.0

SID	Name	Cmssion Status	Staffing		Config	Multiple Sensors	Comms	ZR	TSTM / ALDARS	GTA	ACE	RVR
			NWS	FAA								
CLE	Cleveland, OH	Y	FT	-	2 DCP	M	AFOS	ZR	-	-	-	-
CON	Concord, NH	Y	FT/C	-	1 DCP	-	PACE	ZR	TSTM	GTA	-	-
DCA	National Reagan, VA	Y	-	FT/C	1 DCP	B	PACE	ZR	-	-	ACE	EDIT
DMH	Baltimore, MD	Y	-	-	SCA	-	AFOS	-	-	-	-	-
MRB	Martinsburg, WV	N	-	-	1 DCP	-	ADAS	ZR	ALDARS	GTA	-	-
THU	Thomasville, PA	Y	-	-	1-DCP	-	ADAS	ZR	-	GTA	-	-
ABQ	Albuquerque, NM	Y	FT	-	1 DCP	-	AFOS	-	-	-	-	-
ALI	Alice, TX	N	-	FT/C	1 DCP	-	ADAS	-	ALDARS	GTA	-	-
COT	Cotulla, TX	N	-	FT/C	1 DCP	-	ADAS		ALDARS	GTA	-	-
CRP	Corpus Christi, TX	Y	FT	-	1 DCP	-	AFOS	-	-	-	-	
CSV	Crossville, TN	N	-	FT/C	1 DCP	-	ADAS	ZR	ALDARS	GTA	-	-
DHT	Dalhart, TX	N	-	FT/C	1 DCP	-	ADAS		ALDARS	GTA	-	-
INK	Wink, TX	N	-	FT/C	1 DCP	-	ADAS	ZR	ALDARS	GTA	-	-
LCH	Lake Charles, LA	Y	FT	-	1 DCP	-	AFOS	-	-	-	-	-
MEM	Memphis, TN	N	-	FT/C	3 DCP	B	ADAS	ZR	ALDARS	-	-	NGRVR

SID	Name	Cmssion Status	Staffing		Config	Multiple Sensors	Comms	ZR	TSTM / ALDARS	GTA	ACE	RVR
			NWS	FAA								
OKC	Oklahoma City, OK	Y	-	FT/C	1 DCP	-	AFOS	ZR	-	-	ACE	NGRVR
PBF	Pine Bluff, AR	N	-	FT/C	1DCP	-	ADAS	ZR	ALDARS	GTA	-	-
SSI	Brunswick, GA	N	-	FT/C	1 DCP	-	ADAS	-	ALDARS	GTA	-	-
TCC	Tucumcari, NM	N	-	FT/C	1 DCP	-	ADAS		ALDARS	GTA	-	-
GRR	Grand Rapids, MI	Y	FT	-	2 DCP	M	AFOS	ZR	-	-	-	-
ICT	Wichita, KS	Y	FT	-	1 DCP	-	AFOS	ZR	-	-	-	-
ISN	Williston, ND	Y	FT	-	1 DCP	-	PACE	ZR	TSTM	GTA	-	-
LBF	North Platte, NE	Y	FT	-	1 DCP	-	AFOS	ZR	-	GTA	-	-
MCW	Mason City, IA	N	-	FT/C	1 DCP	-	ADAS	ZR	ALDARS	GTA	-	-
OFK	Norfolk, NE	Y	FT/C	-	1 DCP	-	PACE	ZR	TSTM	GTA	-	-
ACV	Arcata, CA	N	-	FT/C	1 DCP	-	ADAS	-	ALDARS	GTA	-	-
DAG	Daggett, CA	N	-	PT/C	1 DCP	-	ADAS	-	ALDARS	GTA	-	-
DUG	Douglas Bisbee, AZ	N	-	PT/C	1 DCP	-	NONE	-	ALDARS	-	-	-
ELY	Ely, NV	Y	FT/C	-	1 DCP	-	PACE	-	TSTM	GTA	-	-
HVR	Havre, MT	Y	PT/C	-	1 DCP	-	PACE	ZR	TSTM	GTA	-	-
LAX	Los Angeles, CA	Y	FT/C	-	2 DCP	B	PACE	-	-	-	-	NGRVR
OAK	Oakland, CA	N	-	FT/C	1 DCP	B	ADAS	-	ALDARS		-	

SID	Name	Cmssion Status	Staffing		Config	Multiple Sensors	Comms	ZR	TSTM / ALDARS	GTA	ACE	RVR
			NWS	FAA								
SEA	Seattle, WA	Y	-	FT/C	2 DCP	B	PACE	ZR	-	-	-	NGRVR
SLC	Salt Lake City, UT	Y	FT/C	-	2 DCP	M/B	AFOS	ZR	-	-	-	NGRVR
ADQ	Kodiak, AK	Y	FT	-	1 DCP	-	ADAS	ZR	-	-	-	-
FAI	Fairbanks, AK	Y	FT	-	2 DCP	M	ADAS	ZR	-	-	-	NGRVR
PAQ	Palmer, AK	Y	-	PT	1 DCP	-	GS-200	ZR	-	GTA	-	-
HNL	Honolulu, HI	Y	FT/C	-	2 DCP	B	ADAS	-	-	-	-	EDIT
ITO	Hilo, HI	Y			1 DCP	-	ADAS	-	-	-	-	-

WS HQ USE ONLY

WS FORM A-26 (4/94)
Supersedes WS Form A-23 and WS Form H-23, which are obsolete

U.S. DEPARTMENT OF COMMERCE
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION
NATIONAL WEATHER SERVICE

ENGINEERING MANAGEMENT REPORTING SYSTEM
MAINTENANCE RECORD

Document Number: **G 49978**

General Information

1. Open Date	Time	2. Initials	3. Response Priority (check one)	4. Close Date	Time
01/ 04 / 99	0900	DKR	O Immediate O Low O Routine ☒ Not Applicable	01 / 04 / 99	1100

5. Description

UPGRADED VOICE PROCESSOR BOARD I.A.W. MOD NOTE 50D

Equipment Information

6. Station ID	7. Equipment Code	8. Serial Number	9. TM	10. AT	11. How Mal.
CLE	AACU	000353	M	M	999

12. EQUIPMENT OPERATIONAL STATUS TIMES

a. Fully Operational	b. Logistics Delay	Partly Operational	c. All Other	d. Logistics Delay	Not Operational	e. All Other
1:00						1:00

13. Parts Failure Information

Block #	a. ASN	b. NSN	c. TM	d. AT	e. How Mal.	f. Qty.	g. Maint. Hrs.
1							
2							
3							
4							
5							

14. Work Load Information

Type	Staff Hrs.
a. Routine	
b. Non-routine	
c. Travel	01:00
d. Misc.	01:00
e. Overtime	

Miscellaneous Information

15. Maintenance Comments

INSTALLED VOICE FIRMWARE VERSION 4.0

16. Initials: **DKR**

17. SPECIAL PURPOSE REPORTING	a. Mod. No.	b. Mod./Act./Deact. Date	c.	d.	e.
	50D	01/04/99			

18. CONFIGURATION MGMT. REPORTING (use as directed)	a. Block #	b. Manufacturer's Part No. of New Part	c. Revision No. of New Part